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NATURAL HISTORY NOTES ON COLEOPTERA.—No. 4.

BY JOHN HAMILTON, M. D., ALLEGHENY, PA.

Bembidium undulatum, Sturm. There are now about thirty-eight species of Carabidæ recognized as indigenous to North America and Europe, and some of them also to Asia. The most of these are arctic or very northern, this being one of the few that occur in temperate America, but how far northward it inhabits is unknown, as I know only of its occurrence here, though in Europe and Asia it is found in sub-arctic regions. Here it is taken abundantly in July and August under decaying vegetation in moist alluvial places subject to occasional inundation. It is a Notaphus, .20 inch long, shining, elytra obscurely rufo-piceous, paler at apex with oblique pale mark, punctures of striæ obsolete behind middle and surface undulated. Identical with European specimens, and also verified by Dr. Horn.

Bembidium assimile Gyll. (*frontale* Lec.) is found here with the preceding, but much more abundantly; I have it from Florida, and it seems to occur generally eastward from the Mississippi, and also in Kansas. In Europe and Asia it has the same distribution as *undulatum*. On comparison with European specimens no point of difference has been discovered.

Platynus pusillus Lec. Having recently examined and compared a number of *Anchomenus oblongus* Fab. from Sweden with the same number of the foregoing from Massachusetts, I conclude that Dr. Horn would have been entirely justifiable in pronouncing the species identical (Tr. Am. Ent. Soc., ix., 142), where he writes, "the only striking difference between the two being in the slightly wider thorax of our species." This difference, when a number of each is examined, is observed to be merely individual, and were I to write of the thorax, on the basis of a numerical estimate of what is before me, the statement in the above quotation would be reversed. The species has a wide distribution on this continent—Vermont, Massachusetts, New York, Canada to Kansas. In the Eastern

Hemisphere it extends across Europe, and in Asia, throughout Western Siberia.

Harpalus caliginosus Fab. The stridulation of this common beetle is referred to in Ent. Amer., ii., 239, as not recorded previously and as a discovery of Dr. Horn, and also that stridulation takes place only when the beetle is at liberty, and can not be made to do so when handled. This species and *H. pennsylvanicus* DeG. feed on ragweed (*Ambrosia artemisiifolia*) when it is in bloom—here, in July, and both are excessively abundant. Let the entomologist visit on a calm, sultry evening, before sunset, some stubble field bordered by woods, when this weed is in flower, and he will often witness a lively and by no means quiet scene; hundreds of the former and thousands of the latter will be seen mounted on the weeds, each actively and intently employed in collecting the pollen from the flowers, or licking some delectable morsel from the leaves and occasionally evidencing its delight in a sonorous manner—a sudden squeak—somewhat like the noise made by a steel pen scratching rough paper; and so intent are they on the business in hand as to be captured before observing the approach of an enemy.

Stridulation is effected in both by the beetles rubbing the large costæ of the wings against the elytra, these costæ being coarsely transversely rugose from the base to near the apex. Stridulation is readily produced after death by pressing intermittently on the elytra, provided the costæ are in a position to be brought in proper contact with them.

H. compar and *H. longicollis* are catalogued as varieties of *H. pennsylvanicus*, but curiously enough, though abundant, they do not seem to have the same tastes, as I have never taken a single specimen of either on ragweed, though carefully sought for. I strongly suspect they are really three distinct species, notwithstanding the near approach in form of some individuals, and certainly nothing is gained by the collector by classifying them as varieties.

Graphoderes fasciatocollis Harr. was considered to be the same as the European *G. cinereus*, till separated by Dr. Sharp in his learned Monograph of the Dytiscidæ, p. 693; this separation is pronounced "unwarranted" by Dr. Horn, Tr. Am. Ent. Soc., x., 280. Two primary points of difference are given by Dr. Sharp; the first, that the male of *fasciatocollis* has "twenty-three" small pallettes on the anterior tarsus and twelve on the middle, while that of *cinereus* has "about twenty-eight" on the anterior and fourteen on the middle one; the second, that in the former

the punctuation of the elytra is dissimilar in the sexes, being in the female fine and deep at the sides and somewhat dense at the base, while those of the latter are alike in both sexes. Recently I examined several specimens of *cinereus* from Prussia and compared them with American forms, with the result of confirming Dr. Horn's opinion. Four males have each from thirty to thirty-three small pallettes on the anterior tarsus, and four have twenty-eight—all with fourteen on the middle; one has twenty-five on the anterior and twelve on the middle, with two rudimentary; one has twenty-three on the anterior and twelve on the middle, with doubtful traces of two others. As the pallettes decrease in number they increase in size and distinctness, but do not equal those in my single American male. The sculpture of the elytra in the sexes (seven females seen) might be termed uniform, though the punctuation is more pronounced in two or three females; the anterior black band of the thorax does not "always attain the front margin," but exhibits the same variableness as exists among American individuals. With the above I have compared one male and three females of *fasciatocollis* from Massachusetts and one female taken here; the male has twenty-three small pallettes on the anterior and twelve on the middle tarsus, all larger than in the European forms. Whether this number is constant, or variable as in the foreigners, would be desirable to know, that is, in a number taken together, for Dr. Horn has demonstrated the variableness when from distant localities. The three Massachusetts' females have the elytra sculptured like the male and could not be distinguished in this respect from their European sisters; but the female taken here is much coarser sculptured and punctured than ever Dr. Sharp's description requires. Both the points insisted on by the learned Doctor for separate species are shown by the above to be untenable.

Philhydrus fimbriatus Mels., one of the most common of the Hydrophilidæ, inhabits in great abundance all wet places, especially where there is mud—swamps, ponds, springy places, springs on hill and mountain sides, etc. It is variable in sculpture, size and color. The intention here is to bring to notice a dwarf race that inhabits the little rivulets that flow down hill and mountain sides from springs. While the normal form is piceous black with pale thoracic and elytral margins, and about .20 inch in length, this might be termed gray with paler margins, and in length is not over .15 inch. In summer these spring runs are often dry for long periods, and the beetles then crawl under stones and rubbish where there

is a little moisture; these long droughts and the comparative scarcity of food undoubtedly have dwarfed them, and living in clear water clinging to stones has called into exercise a potential element that seems to inhere in many insects of accommodating their colours to their surroundings. The black colour of the mud-inhabiting race would make them too conspicuous, so they have changed it to sober gray to correspond with the general colour of the stones and bottom of the brook.

Oxyporus 5-maculatus Lec. Seven other species of this genus occur here more or less abundantly from the middle of August onward, all living on various species of living mushrooms; but *5-maculatus* appears to be rare, as I have only taken it three times—two at a time, and like the others, feeding on mushrooms, but in June, and on rocky, mountainous places. It differs remarkably from the other species by having the sides of the thorax posteriorly so compressed as to elevate the disk at the middle of each side at base into a flattened tubercle in such a way as to make the expression, "thorax posteriorly concave," not inappropriate.

Dendrocharis flavicornis Guer. A specimen of this curious insect, now in the cabinet of Dr. Horn, was recently taken near St. Augustine, Florida, by Mr. Charles W. Johnson, who dug it out of a tree. This is the only native specimen in any of our collections so far as known. See figure and description, Tr. Am. Ent. Soc., xiii., 12.

Meristhus. If the definition of this genus in the Classification, "Front tarsal grooves wanting," is correct, the two species under it in the Catalogue should be placed under *Lacon*, as they have these grooves deep. I suspected a misprint of "tarsal" for tibial, but a careful examination shows the existence of these grooves quite evidently in some specimens of *cristatus*, though obsoletely so in others. There seems to be little need of the genus anyhow.

Dicerca prolongata Lec. and *D. divaricata* Say. A single character that will in all cases separate these species infallibly is something not yet in print. The prolongation and degree of divarication of the elytra are the same in both; a typical specimen of the former kindly sent me by Mr. Ulke, collected in Dakota, has the tips of the elytrons as widely separated as in *divaricata*, while on the other hand I have a specimen of the latter with the tips very prolonged and contiguous to near the end (*D. dubia* Mels.) The depth and distinctness of the thoracic channel is not a character to be depended on; my type of *prolongata* has a very deep and uninterrupted channel, but I have a specimen of the other taken

here approaching it closely, and from this are all degrees of variation to the slightest noticeable depression. No character can be derived from the spurs of the middle tibiae of the males, for when a large number of *divaricata* are examined, this will be seen to vary from a mere tubercle to a formidable spur with long teeth on the distal edge. Colour, as a character, is not worthy of consideration. I have a specimen of *prolongata* from Canada with the upper side polished black with a purple reflection and the under coppery black. A point given me by Mr. Ulke (a character given by Dr. LeConte) is more permanent than any of those mentioned above, viz., tips of the elytrons with the angles rounded—*prolongata*; tips of the elytrons with the sutural angles terminating in a small spine—*divaricata*. This is the most constant character noticed, but by itself fails in individual cases under observation. I do not question the distinctness of the species. *Prolongata* breeds, so far as known, in conifers, and inhabits high altitudes and latitudes, while *divaricata* is more southern, being abundant in parts of Canada and all the States east of the Mississippi, breeding in diseased or dead deciduous trees, as beech, maple, apple, cherry, etc.

Dicerca obscura Fab. For a set of typical specimens of the real *obscura* as defined by Dr. LeConte, I am indebted to Mr. Ulke, who takes it quite commonly at Washington, D. C., on persimmon (*Diospyros Virginiana*). There is a tendency among collectors to confuse this with Dr. LeConte's *lurida* Fab., as defined in his Monograph, and to give the latter either name according to fancy. My observations, however, are that there are sufficient differences to keep them apart, at least as races, and to the collector this is the same as if they are separate species. In an examination of about one hundred and twenty specimens of *lurida* taken here or received from other places, I find that the thorax is in every case wider near the middle than at base, and that behind the middle the sides converge more or less to the base in a line varying from nearly straight to deeply sinuous. In *lurida* the reverse occurs, the widest part of the thorax is the base, and the convergence, though not great, is directed anteriorly, and from the middle to apex is more pronounced. The directions of Dr. LeConte in his Monograph, if strictly followed, are quite sufficient to effect a separation. *Lurida* breeds in dead and diseased hickory, and is very abundant, but I have never seen a specimen of *obscura* taken here.

Dicerca spreta Gory appears to be rare and I have it not, though

asperata Lap. & Gor. has been sent me for it by good collectors. Errors are mostly difficult to eradicate, and this one is not likely to be got rid of soon, at least not till the genus is monographed anew. The trouble is about this way. Dr. LeConte in his Monograph (Tr. Am. Phil. Soc., xi., 198) fully and clearly described a *spretæ* and an *asperata*, which, of course, went so into all collections; but fourteen years afterwards Mr. G. R. Crotch (Proc. Acad. Nat. Sci., 1873, p. 85) states that the names given by Dr. LeConte should be reversed, but in his Catalogue misplaces the species, though giving the synonyms. In Mr. Henshaw's Catalogue the same order is followed, but the synonyms dropped, and now nothing points to an error in Dr. LeConte's Monograph. The error was corrected in few of the older collections, and is transmitted from them by tradition, while the latest catalogue indicates no error to one not conversant with the whole literature of the subject.

Aphodius rufipes Lin. is mentioned at page 9. Mr. Blanchard, of Mass., writes that he has a specimen collected in the mountains of North Carolina. These mountains are the Alleghany, the same as at St. Vincent's and at Deer Park. Thus, this recent discovery is already traced in a direct line over this continuously rugged country more than 400 miles.

Stenosphenus notatus Oliv. breeds in the limbs of dead hickory; it becomes a pupa the latter part of the second year and the imago is perfected before winter, but remains in the wood till the April or May following. *Neoclytus caprea* Say, which breeds in ash and often renders worthless logs cut before June, follows the same course. A manufacturer who uses this timber showed me a log in his shop in December that must have contained hundreds. When split in any direction the beetles crawled out of the opened burrows and appeared quite active.

Saperda consolor, mentioned page 8, Mr. Blanchard informs me, breeds in a low willow and in *Populus tremuloides*—in Massachusetts, the "Common Poplar," but here and everywhere west of the Alleghanies, the "Quaking Asp." How many other trees are "Common Poplar?"

Chrysomela præcelsis Rogers, when found, is in abundance, but its habitat is limited. It feeds on the leaves of Convolvulæ (*Ipomœa pandurata* and *Calystegia sepium*) growing on the banks of rivers and moist alluvial ground, but not on the same plants when away from water. Its season of abundance is about the middle of June.

Apion herculaneum Smith occurs plentifully about the last of May on

the cymes of the maple-leaved arrow-wood (*Viburnum acerifolia*) just as they are going out of bloom. The fruit of this does not ripen till October, and some larva lives in the fleshy substance in which the thin, flat coriaceous seed is immersed, which is probably that of this *Apion*, though not yet so proven. This is one of the largest species of the genus, and when beaten into the umbrella behaves and looks so much like the worthless *Anthonomus quadrigibbus*, that till the past season it was always rejected.

DESCRIPTION OF THE PREPARATORY STAGES OF ARGYNNIS HESPERIS, EDW.

BY W. H. EDWARDS, COALBURGH, W. VA.

EGG.—Conoidal, round-topped, nearly as broad at base as high, the top depressed; marked by about 19 thin, elevated, vertical ribs, one half running from base to summit, the others but four fifths or more the distance; the spaces between crossed by many low horizontal ridges; the micropyle surrounded by two or three circles of very fine depressions, outside of which are rows of very large four or five-sided depressed cells; color yellow-green. Duration of this stage about ten days.

YOUNG LARVA.—Length .06 inch; cylindrical, thickest in middle; color yellow-green; marked as in the allied species by rows of flattened tuberculous brown spots, each of which gives one or two long, tapering hairs; on dorsum of 2 a dark oval patch with a row of hairs in front, turned forward, and a shorter row behind; head obovoid, black, with many long hairs. The larva hibernates directly from the egg.

After First Moul: Length .1 inch; color green, mottled with brown over dorsum; the under side pale green; the spines in number and position as at maturity, and as in the genus, small at base, tapering little, wholly black, beset with many short black bristles; head obovoid, black, with black hairs. Duration of this stage eight days, in April and May.

After Second Moul: Length .15 inch; color brown and gray; a double indistinct gray dorsal stripe, and a similar one between dorsal and upper lateral spines; the spines black; those of the middle row have the bases on outer side pale yellow, of the lower row the bases are wholly pale yellow; head as before. Duration of this stage eight days, in May.

After Third Moul: Length .28 inch ; color black and dark gray, the sides mottled ; the double dorsal stripe more definite than before ; the spines as before ; head same also. To next moult four days, in May.

After Fourth Moul: Length .44 inch ; color black and gray ; the dorsal stripe now solid, dark gray ; the spines black to bases except those of lower row, and on 3 and 4 of middle row, all which have yolk-yellow at base and half way up the stems ; all bristles black ; head brown-black over the front with many black hairs, long and short, the back brownish-yellow. To next moult eight days, in May.

After Fifth Moul: Length .7 inch ; in about eight days was fully grown.

MATURE LARVA.—Length 1.2 to 1.4 inch ; slender, somewhat thickened in middle, the segments well rounded ; color wholly velvet-black or brown-black (no gray dorsal stripe as before last moult) ; three rows of spines on either side, as in the genus, all of them yellow nearly to tip, the rest black ; feet black, pro-legs brown-yellow ; head sub-cordate, the vertices rounded, dull brown in front, dull yellow at back. From fifth moult to pupation 14 days.

CHRYSLIS.—Length .9 inch ; breadth across mesonotum .26, across abdomen .23 inch ; like *Atlantis* in shape, but stouter ; color dark brown over head and wing cases ; so also on the front of each abdominal segment, in serrations, the rest yellow-brown. Duration of this stage ten days, in June

HESPERIS flies in Colorado, Utah and Montana. Mr. Bruce writes me of its habits thus : "*Hesperis* is by far the most abundant species of the genus along the canons and water courses of the eastern or front range of the Rocky Mtns., in Colorado, at from 6,500 to 8,000 feet elevation. It is very active and restless, and difficult of capture except when on flowers. They are very partial to the bloom of Clematis, and I have frequently taken several at one sweep of the net on this plant ; later in the season, on the tall Sunflower. The wild Bergamot and Horse-mint are much frequented by them. They are also fond of alighting on the ground in damp places, especially, late in the summer, when they are worn. I have taken them in Clear Creek and Platte canons from June 16th till end of August. *Hesperis* is a very pugnacious insect, and will circle round and boldly flap the *Lycenas* and *Theclas* off the blossoms. I was amused one day, on the South Platte, with watching a male *Hesperis*

endeavoring to drive a Zygaenid moth (*Anatolmis Grotei*) off the blossoms of a large species of Senecio. The moth, which is a sluggish creature at all times, would not fly, but slowly backed round the corymbose head of flowers, occasionally lifting its front legs in feeble protest. *Hesperis* followed it, flapping its wings and clawing at it like a cat, till the persecuted moth at last escaped by slipping over the petals, and hanging on the under side. It is probably owing to this restless and quarrelsome disposition that individuals are so soon worn and broken. They vary much in size and in the color of the spots on under side, some being of a deep buff, others a dead white, and others with a trace of frosted silver. I have taken *Hesperis* just below the timber line, but it is not common at such elevations, nor below 6,500 feet in Colorado."

Mr. Bruce sent me eggs of this species from Denver, Colorado, which I received 9th July, 1886, and a second lot three days later. The eggs hatched at ten days, and after eating the shells, the larvæ went into lethargy. I sent them soon after to Clifton Springs, N. Y., to go in a cold room there, and they were returned 21st March, 1887, nearly all alive. But they came unexpectedly, and a month too soon, and before I could force a plant of violet for them nearly all had died. Of the few survivors, one passed 1st moult 20th April, the second 3rd May, the third 11th May, the fourth 15th, the fifth 23rd. This larva pupated 6th June, and the imago came out 16th June. Another pupated 11th June, but died before imago. The habits of the larvæ in confinement are similar to those of *Atlantis*. The butterfly is figured in Vol. 1, Butterflies of N. America.

SOME NEW NOCTUIDÆ.

BY G. H. FRENCH, CARBONDALE, ILL.

Cucullia Hartmanni, n sp.

Expanse 1.75 inches, length of body .75 inch. General color of fore wings pale gray, so suffused in places with dark gray as to give the wings a moderately dark gray cast, but not so dark as *C. intermedia*, Spey. Lines black, basal half line only indicated on the costa. T. a. line double; the inner part almost imperceptible; strongly dentate, from its origin projecting obliquely outward to a strong tooth on the fold in the discal cell,

with a short tooth on the fold between the costal and subcostal veins ; from discal tooth it recedes to median vein a little nearer the body than its inception on the costa ; from this it extends out in another tooth nearly twice as far out as the discal tooth, the point resting on the submedian fold, almost reaching the inflexion of the t. p. line, the points of both lines nearly obsolete in a white patch at this place that fades out into the general color ; about the middle of the space from the median vein to submedian fold a brownish black spur is sent out parallel with the median vein, terminating above the middle of the white patch ; the line reaches the posterior margin by another inflexion on submedian vein, and another outward tooth below the vein. A fine line extends along the submedian fold to the white patch. Median shade distinct above the cell, outwardly oblique. Stigmata only indicated by a slight brown discoloration, except below the reniform is an arc on the median vein as though part of the annulus. T. p. line obsolete except on costa and below second median venule, the angle next to the white patch filled with a black shading ; from this a slightly double curved line extends to end of first submedian venule. Veins finely black ; in s. t. space a tendency to black interspaceal lines. Terminal line black, broken, a few inward inflexions. Fringe gray, brown tinted, a paler central line, cut with white at the end of veins to this line.

Hind wings sordid white, veins dark, a broad smoky black border that is narrow at the anal angle. Fringe pale with a dark sub-basal line.

Palpi porrect ; third joint slender, dark brown ; sides of first and second, brown mixed with white, white beneath. Eyes naked, without lashes. Head gray, a space between the antennæ with a black annulus. Collar gray with three narrow black lines, first space suffused with pale brown, tips of posterior scales white. Pategia clear pale gray, apparently a narrow terminal line. Thorax gray, one specimen shows indication of a very slight posterior tuft, but not more so than some *Agrotis*. Abdomen whitish, slight dorsal dark gray tufts on joints 1 to 3, usually a dorsal dark line, suffusion of pale brown on joints 4 to 7. Beneath whitish with a slight yellowish tinge ; legs gray, tarsi dark ; tibiæ unarmed.

Described from three specimens taken at Hockley, Harris Co., Texas, by my friend, Leopold Hartmann, to whom I have dedicated the species ; his number, 105, white label.

This is near *C. serraticornis*, Lintn., but differs in the antennæ being simple, and several points in coloration.

Hadena Evelina, n sp.

Expanse 1.50 to 1.70 inches, length .80 inch. General color of fore wings dark gray, washed with wine color over subterminal space, between and beyond the stigmata, and between median and submedian veins between t. a. and t. p. lines, the gray having a slight purplish reflection over the rest of wing. Markings black, of a brownish cast, perhaps more properly vandyke brown. Lines moderately distinct, double, the enclosed space a little pale; inner part only of basal half line distinct; t. a. line slightly oblique, straight in its general course; outward teeth on subcostal, median and submedian veins, the last two the most prominent; t. p. line only moderately outward curved beyond the cell, dentate; claviform extending one third across the median space, the t. a. and t. p. lines connected through this by an umber shade bar; s. t. line sometimes continuous, ochreous, dentate, the inner teeth interspaceal, these more prominent; five of them continued nearly across the s. t. space by umber dashes, these connected with black interspaceal dashes that extend across the terminal space to the outer margin. In others only the interspaceal light points are present, with mere traces in places of the line; stigmata concolorous, annulate with broken ochraceous, with mere traces of a black annulus; orbicular large, nearly circular, slightly oblique. A basal dash below half line. Fringe gray, a fine pale basal line, next to the terminal black lunulate line at the end of the wing.

Hind wings smoky white, a little more soiled terminally; a black terminal line; fringe concolorous, pale at the base.

Eyes naked; antennæ of male serrate, female simple; head, palpi and thorax concolorous with fore wings; a central black line on the collar, a black line also on patagia; dorsal tufts on thorax and abdomen prominent, concolorous. Abdomen darker than hind wings. Beneath, body pale purplish gray; tibiae unarmed.

Described from three males and one female taken by Mr. C. F. McGlashan at Truckee, California; his number, 93. I have also a faded specimen from Shasta Co., Cal., taken by Mr. James Behrens.

In color and lack of strong outward inflection of the s. t. line, forming the usual M, this species belongs with *H. Arctica*, Bd., and its western ally, *H. Occidens*, Grote. The shade bar between the t. a. and t. p. lines relates it to *H. Bridghamii*, G.-R., placing it between *H. Arctica* and *H. Bridghamii*.

STRAY NOTES ON MYRMELEONIDÆ, PART 4.

BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

(Continued from vol. xx., page 60.)

6. *Brachynemurus nigrilabris* Hagen. N. sp.

Very similar to *B. peregrinus*. Face yellow, above with a large black band, which is rounded below and reaches nearly the clypeus; this band is going between and around the antennæ and connected above with the black part covering the whole anterior half of the vertex; posterior half yellow with a broad black longitudinal band, dilated angularly in middle; the angle sometimes protracted on each side in fine line, which does not reach the eyes; labrum shining black; palpi yellow, last joint of the maxillary cylindrical black; labials a little longer, last joint shining black, fusiform, sharply pointed, less inflated than in *B. peregrinus*. Antennæ longer than head and prothorax, fuscous, the apex nearly luteous; of the male, 8.5 m. m. long; of the female shorter, 7 m. m. long, visibly more clavate. Prothorax a little longer than broad, rounded, before yellow, with two approximate black bands, reaching the front margin, connected below with a shorter black external band, which reaches only the transversal furrow; a black line below the side margin; mesothorax black with two yellow dots in front, and two on each side near the wing; on the disc two yellow triangles in opposite position; hind middle portion yellow, with the anterior margin and two longitudinal bands black; metathorax similar, a black dot in the yellow triangles; sides of the thorax black with a few yellow stripes. Abdomen faintly villous, brownish, below fuscous, articulations pale; of male much longer than wings, three last segments blackish; appendages very short, pale brownish, hairy, cylindrical, blunt; between them and below a short pyramidal part; abdomen of female as long as wings, similar, articulations pale, last segment pale, on each side a dark spot; genitals pale, superior part split, with a row of strong black spines; below two short pale cylindrical appendages. Legs yellow, with black spines, femurs with a black band externally on the two hind pairs, with a black spot on tip of fore legs; tibia internally with a black line, those of fore legs variegated with brown; tip of tarsal joints faintly black; spurs brown, as long as the two basal joints. Wings hyaline, pterostigma white; venation brown interrupted with pale; subcosta and mediana

black interrupted with yellowish ; only a few costals before the pterostigma forked.

Length of body, male, 45 to 55 m.m. ; female, 33 m.m. ; exp. al., 56 to 60 m.m.

Hab., New Mexico, Aug., 1872, Mr. Yarrow ; Colorado, Manitou ; Wyoming, Bridger Basin, Mr. Garman ; Salt Lake City, Sept., 1877, Mr. Austin ; Farmington, July 23 ; Ogden, Aug. 2, O. Sacken ; Dakota, Custer Co., Garman. Four males and three females in alcohol, and four females dry.

7. *Brachynemurus blandus*.

Myrmelcon blandus Hag., Syn. N. Am. Neur., 235, 22.

Small, yellow, marked with black. Face pale yellowish, with a superior trifid black spot ; it is united with the vertex by a narrowed part going upward between the antennæ ; on each side below the pale ring around the antennæ it reaches nearly the eyes ; the inferior margin bisinuated, sending a fine black median line to the clypeus ; labrum yellow ; palpi pale, maxillary with last joint cylindrical, brownish ; labials scarcely longer, last joint fusiform, very pointed, brown except on base. Antennæ clavate, strong, about as long as head and thorax, a little shorter in the female, where they are larger clavate, brown, luteous on clava, visibly annulated with yellow, principally on the basal half ; the two basal joints black. Vertex elevated, cut straight in front, black ; above yellow with two large approximate black spots, a little dilated externally. Prothorax as long as broad, yellow, with two black bands, which have anteriorly an external yellow incision ; the outer part of the black band reaches not the transversal furrow ; beneath on each side of the prothorax a black stripe ; mesothorax and metathorax black marked with yellow similar to *B. nigri-labris* ; sides below the wings black, with some yellow stripes. Abdomen clothed with white hairs, yellow above, trilineated with black ; beneath black ; of the male longer than the wings, slender ; appendages half the length of last segment, pale with long dark hairs ; cylindrical, obtuse on tip, which is bent up a little ; between them beneath a small short triangular plate ; of the female as long as the wings ; genitals pale, the upper part split with a transversal row of black spines ; below two short pale cylindrical appendages. Legs yellow, sprinkled with black, with black hairs ; tip of all joints of tarsi black ; spurs brown, as long as the two basal joints. Wings hyaline, hairy around and on the venation, which is black, interrupted by pale yellowish ; pterostigma large, pale yellow.

Length of body, male, 33 m.m.; female, 26 m.m.; exp. al., 40 m.m.

Habit.—The type, a female in bad condition from New Mexico (formerly Western Texas), Pecos River, May 14, from Capt. Pope's Expedition; a female from Idaho, Snake River, by Cyrus Thomas, 1872; a male from Bridger Basin, Wyoming, by Mr. Garman; Nevada, H. Edwards. I have never seen more than these four specimens, which are all alike.

The words of my description, Syn., p. 235, "vertex with two transverse black lines, the hind one interrupted," are to understand that the first line is formed by the front edge of the vertex, the second by the spots described.

ON THE DIAGNOSES OF N. AM. PHYCITIDÆ, BY E. L. RAGONOT.

BY A. R. GROTE, BREMEN, GERMANY.

I have received from the author a copy of this pamphlet in which a large number of North American species and genera are somewhat briefly described in anticipation of the publication of a general Monograph. That M. Ragonot is in a situation to materially increase our general knowledge of the group cannot be doubted. He has long collected types and specimens, and has studied the characters of the Old World genera. I have deprecated the description of *Phycidæ* without giving the full structural characters, and in so far as this has been done do I agree with M. Ragonot's introductory remarks. But I by no means consider that American authors should wait upon M. Ragonot to name their material, nor that what Dr. Staudinger chooses to do is binding upon them in the matter. I object to any hasty descriptions in this group, without denuding the wings and studying the head and mouth parts under the microscope. When this is done and a full description given, the term "hazard" will no longer apply. For the element of certainty in a generic reference in these moths is only relative. I objected to Prof. Riley's descriptions, not because I differed as to the generic references, but because the species were described without structural characters being given, and from the obscure nature of the ornamentation and the great general resemblance among the *Phycidæ*, one can hardly determine a species from a description of the colour and markings alone.

We must wait upon the "Monograph" for the reasons which induce M. Ragonot to call the Family *Phycitidae* and the typical genus *Phycita*, and not as I have given it, *Phycidae* and *Phycis* Haw. I have, however, not yet seen a copy of Haworth. I regard the *Phycidae* or *Phyciinae* as a sub-family of the *Pyalidae*; and M. Ragonot's *Anerastinae* as merely a tribal division of the sub-family. I am not then agreed with M. Ragonot's divisional terms.

I have had no occasion to study M. Ragonot's types. As the generic term *Ciris* (p. 17) is long ago used by me for *C. Wilsonii*, I propose for *discigerella* the name *Ragonotia* after its learned discoverer.

A NOTE UPON AUTHOR'S TYPES.

BY A. R. GROTE.

It has occurred to me to say a few words upon the subject of author's types. It sometimes happens that a specimen is labelled "type," which is not the true type, i. e., the one (or ones) from which the original description was drawn up and which *accords with that description*. This is the criterion for types, that they do not contradict the original description. The late Mr. Morrison sent me at one time a "type" of Harris's *Agrotis tessellata*. Upon my wonder at his having such a specimen, I found it was merely a compared example, but it should not have been labelled "type." To my certain knowledge, Mr. Morrison on occasion labelled as types subsequent material (vide genus *Agrotis*). Only the material at hand and compared when the original description is drawn up, should be labelled as "type." On this head I would say a word as to Walker's types. Only when the evidence is complete and satisfactory should an earlier name of Walker's replace a designation in use. What I call incomplete evidence may be recently offered by Mr. Hulst in proposing to change *Selenia Kentaria*. Dr. Packard it seems had figures drawn from what are supposed to be Walker's types. There is no evidence that these are in every instance the proper types. The cases where more than one species was included by Mr. Walker are not solitary. Dr. Packard interpreted this figure as applying to another form of *Selenia*. Mr. Hulst interprets it differently, and drops a settled name without a question. In whatever way the matter is finally settled, Mr. Hulst would appear to have acted without sufficient evidence. Having studied the original collection

in 1868, during Mr. Walker's lifetime, I am justified in saying that care must be taken that subsequently added specimens are not taken for types. Restitutions should be left to Mr. Butler and the British Museum authorities. The original description must be studied, and facilities other than Mr. Hulst's are needed to make such changes.

ON THE GEOGRAPHICAL DISTRIBUTION OF CITHERONIA.

BY A. R. GROTE, A. M.

I wish to draw particular attention to this genus and its allies. I have, in 1865, drawn a parallel between the group and the Hawk Moths, from the young stages and the peculiar pupation, and in my pamphlet on "the Hawk Moths of North America," I have discussed the probabilities of their relationship. But I here wish to point out that the group is American; that in America we may expect to find old types among that portion of the fauna which is indigenous, pre-tertiary, and to this *Citheronia* belongs. Further than this, the *Ceratocampinae*, which are tropical continental, or South American rather than North American, but comparatively equally spread to-day, seem to belong to the Eastern portion of the New World. That is, east of the Rocky Mountains, the Cordilleras, the Andes; east of the great rocky back-bone of the continent running from north to south. If this is so, it will further illustrate my remarks on the "Geographical Distribution of North American Lepidoptera," which has recently appeared in the pages of the CANADIAN ENTOMOLOGIST. The sub-family, which I separate from the *Saturninae* or *Attacinae*, contains two series of genera or tribes based on larval structure—*Citheronia*, *Anisota* and *Dryocampa* (*rubicunda* and var. *alba*) standing together, as opposed to *Eacles imperialis* and allies. This sub-family, remarkable for its form and habit of pupation, its thick wings, velvety-scaled, its short, sub-simple antennae, stands lower than the *Attacinae* or true Emperor Moths, and seems to borrow some characters from the *Cossinae*. But the larvae are very different; they approach somewhat *Bombyx mori*, which is the most Sphinx-like larva of all the Spinners, yet spins a cocoon, which *Citheronia* does not. That this group is American and has a comparatively defined range, between the mountains and the Atlantic, are matters of no little interest in the study of the distribution and the origin of our North American moths. In the Annals of the New York Lyceum, colored figures are given by the late Mr. C. T. Robinson and myself of

Citheronia regalis Fabr., *C. sepulchralis* G. & R., and *C. Mexicana* G. & R. The Pine Citheronia, *C. sepulchralis* G. & R., is found from Massachusetts to Florida, but I have not heard of its being taken farther north, or in Canada. It seems to be a rare moth, having been taken by Abbot, who seems not to have known its transformations. It was unknown to science until we described it from material found by the late Mr. James O. Treat, of Massachusetts.

NEW WORK ON JAPANESE BUTTERFLIES.

The task of preparing and illustrating a work upon the Butterflies of Japan, after the model of Mr. Distant's RHOPALOCERA MALAYANA, has been undertaken by Mr. H. Pryer, of Yokohama, who with persistent enthusiasm for the past seventeen years has been engaged in collecting the Lepidoptera of the Empire, and studying their habits. The work, entitled RHOPALOCERA NIHONICA, will appear in three parts, 4to. It is printed upon Japanese "untearable paper," made of a curious combination of the fibres of rice straw and silk. The text is in English and Japanese. The plates are drawn upon stone and printed in colours by native lithographers under Mr. Pryer's own supervision, and are truly excellent. The first part, bearing the imprint of the "Japan Mail" office, is before us. The writer during a recent stay in Yokohama had the privilege of examining a portion of the MS. of the Second Part and the proofs of the Plates which are intended to accompany it. It may be worthy of note that the letter-press of Parts II. and III. will greatly exceed in volume that of Part I.

The Japanese islands, stretching from Shumshu, the northernmost of the Kuriles, in Lat. $50^{\circ} 40'$ N. to the Riu-kiu group in Lat. 24° N., possess every variety of climate from the semi-arctic to the tropical. The islands of the great central group, Yesso, Nippon, Shikoku, and Kiushiu, are traversed by lofty mountain ranges, and dotted with volcanic peaks, some of which rise from 9,000-10,000 ft., and one of them to 12,450 ft. above sea-level. Upon the summits of these mountains perennial winter reigns, while at their feet a semi-tropical vegetation blooms and flourishes. In addition to the wide diversity in climates which prevails in the islands and the contiguity of colder and warmer climates due to the mountainous character of the country, there are more subtle influences at work depending for their operation upon the rainfall and the aerial currents. The

atmosphere is characterized in spring and early summer by an excessive humidity, surpassing that of the British Islands, while at other periods of the year there is a well marked "dry season." The result of these various facts, taken in connection with the additional fact that at a remote geological period the islands doubtless were connected with the Asiatic and North American mainland, has been the development of a fauna marked by a wonderfully composite character, and revealing to an unusual extent the phenomena of varietal change, and in the case of the insect tribes, seasonal dimorphism. To these phenomena Mr. Pryer has paid especial attention, with the result of ascertaining that not a few of the so-called species erected by recent entomologists, into whose hands Japanese collections have happened to fall, must be relegated to the great and ever-growing mass of synonymical species. This is especially true of the genera *Papilio*, *Pieris* and *Terias*, in which seasonal dimorphism reveals itself most strikingly. The course pursued by Mr. Pryer in massing a large number of forms of the species originally described by Linnaeus as *Terias Hecabe* under the name *Terias Multiformis* Pryer, is open to criticism on the ground that the labour of the elder nomenclator should have been respected and his name retained, while the names of later writers should have been adduced as synonyms. Nevertheless the fact seems to be established beyond reasonable doubt that the species lumped by Mr. Pryer under the newly coined name *Multiformis*, are all mere local or seasonal variations of *Hecabe* L. It was the privilege of the writer to spend many days in Mr. Pryer's laboratory, and he can testify to the painstaking care which he has taken to avoid error in his deductions. The most surprising result of breeding is, however, one which is not alluded to in Part I. of the RHOPALOCERA NIHONICA, since it was only definitely confirmed during the past summer, viz., the discovery that *Terias Bethesba* of Janson is a dimorphic form of *Terias Laeta* of Boisduval. The entire difference in form of the two has naturally led students unhesitatingly to accept them as widely different species. Careful breeding has established their practical identity.

As the first attempt at a comprehensive and accurate survey of a part of the beautiful insect fauna of "Dai-Nippon," the new work will no doubt be hailed with pleasure by all entomologists who raise their eyes beyond the narrow confines of their own immediate neighborhoods, and seek to ascertain the truth as to the whole of Nature.

W. J. HOLLAND, Pittsburgh, Pa.

CORRESPONDENCE.

CALLIMORPHA.

Ed. Can. Ent.—Dear Sir : In reference to my former note on *Callimorpha*, I would state that in my "Check List" the white forms were referred to *Lecontei* as varieties. I was totally unacquainted with what may be a more Northern form, viz., *confusa* Lyman. Mr. Lyman's excellent plate and paper must be commended, but I must insist that neither Mr. Lyman (nor Mr. Smith for that matter) have done more than separate the forms in the perfect state; and in this Mr. Lyman seems to have shown great tact and is the more correct, having made no fresh synonyms. The yellow species commence the series in my Check List, in which *vestalis* and *fulvicosta* are distinguished as different forms or varieties, and I have only to add to my former communication respecting the interchange of yellow and white in this Subfamily, that it notoriously occurs in the sexes of *Leucartia acraea*. The American species of *Callimorpha* are probably not long separated from an original type—they form to-day a pro-genus, like *Datana*. In such cases where the naturalist attempts to still further separate the species or races as Mr. Smith has done, the work of all previous describers should be studied and certainty attained as to what forms have been already named and what remain without a designation. In all this work there is nothing really original. When some one breeds all these forms, as Mr. Edwards does the doubtful Butterflies, there will be a real scientific addition to our present imperfect knowledge.

A. R. GROTE.

Dear Sir : Dr. Harris, in his well known work on Injurious Insects, states that the caterpillars of the Callimorphas conceal themselves in the day time under leaves and stones. According to my experience, the larvæ of *Lecontei* and *confusa* may be found on the food plants at all hours of the day. About ten or twelve years ago, *Lecontei* was rather abundant on certain parts of Montreal Mountain, and I observed quite a number of the larvæ, from some of which I reared the moths. I unfortunately neglected to take a description of the larva, nor did I ascertain what the food plant was. When the Mountain was opened as a public park, a carriage drive was cut right through the *Lecontei* ground, and since that time it has become very scarce, and I have so far failed to re-discover the

laiva; however, as I have elsewhere stated, I feel confident that careful breeding will prove *Lecontei*, *confusa* and *contigua* to be good species. In his paper on *Callimorpha* (CAN. ENT., vol. xix., p. 237), Mr. Smith is in error in stating that I "assumed the distinctness of *Lecontei* and *militaris*." I gave *militaris* as a variety of *Lecontei* and assumed the distinctness of *Lecontei* and *confusa*, which is a very different thing, and should have aided rather than misled him. I have found hibernated specimens of *Lecontei* and *confusa* easy to rear, the latter in confinement feeding freely on almost any kind of leaf. Might not these hibernating Arctians be reared by placing them on ice, as Mr. Edwards has done so successfully with the diurnals?

F. B. CAULFIELD, Montreal.

Dear Sir: In reference to Dr. Hagen's recent notice of Calverley's illustrations of Sphingidae, I would say that the plates are neither "unknown" nor "forgotten," but simply "unpublished." References to their existence may be found in my printed papers. To certain of the figures I furnished the types. Dr. Hagen makes some remarks as to the quality of the illustrations. It is perhaps not remarkable that he does not notice that many figures are copies from Cramer and Drury, and that the plate of *Papilio Calverleyi* is the same as published in Proc. Ent. Soc. Phil., on different paper. Copies of Calverley's Sphingidae were sent to a few principal libraries, hence it is not extraordinary that Dr. Hagen should have found one at Harvard. The work owes its inception perhaps to the zeal of the late Mr. Stephen Calverley, who was a correspondent of Doubleday. The names of its two original authors are remembered in *Limenitis Weidemeyerii* and *Papilio Calverleyi*, as well as *Deilephila Calverleyi* from Cuba. The text should have been written by myself, as at one time at least intended, but the plates were finished at such irregular periods and over so many years (1860 to about 1869) that they were never placed complete in my hands for the purpose.

A. R. GROTE.

ERRATUM.—On page 57 (March No.), line 11 from the bottom, for "vol. xix." read "vol. xx."

Mailed April 10th. Delayed by accidental loss of proofs in transmission.

